have been given, it cannot escape our notice, notwithstanding their apparent difference, that the same plan has presided at their formation, or in other words, that they possess a unity of structure. We observe, however, this remarkable circumstance in their mode as in their degree of evolution, that the one always seek the light, under the influence of which the principal phænomena of their fructification take place, while the others pass through the first, or all the phases of their life, free from the influence of this modifying power; that is to say, that they ripen their spores in a closed receptacle, and that in general this opens only when they are ready for dispersion. The evolution of the second is, as we may say, of a lower grade than that of the first. But in comparing *Gyrophragmium* especially with an Agaric, it is easy nevertheless to perceive the perfect analogy which exists between the two series, examined towards their culminating point. The resemblance would be still more striking and almost complete, at least as regards external form, if it be proved some day that *Montagnites* belongs also to the *Gasteromycetes*, as we are permitted to suspect from its affinity with *Gyrophragmium*. It is then that the simplicity and independence of the partitions,—carried to the highest degree, since they are fixed to the top of the stem by a single point, frequently by a short thread, and radiate horizontally like the gills of an Agaric,—it is then, I say, that this independence and simplicity would raise the *Gasteromycetes* almost to the same grade as the *Hymenomycetes*, always however considered abstractedly of their morphosis, which is essentially different*.

PROCEEDINGS OF LEARNED SOCIETIES.

GEOLOGICAL SOCIETY.

February 1, 1843.—"On the Geological position of the *Mastodon giganteum* and associated fossil remains at Bigbone Lick, Kentucky, and other localities in the United States and Canada." By Charles Lyell, Esq., V.P.G.S.

With a view to ascertain the relations of the soil in which the bones of the Mastodon are found, to the drift or boulder formation, whether any important geographical or geological changes had taken place since they were imbedded, and what species of shells are associated with them, Mr. Lyell visited a number of places where they had been obtained. In this paper he gives the result of his researches.

The most celebrated locality visited was Bigbone Lick, in the northern part of Kentucky, distant about 25 miles to the S.W. of Cincinnati, situated on a small tributary of the river Ohio called Bigbone Creek, which winds for about 7 miles below the Lick before joining the Ohio. A "Lick" is a place where saline springs break

* The latter part of this article is translated from 'L'Institut,' May 4, 1843.

out, generally among marshes and bogs, to which deer, buffaloes, and other wild animals resort to drink the brackish water and lick the salt in summer. The country around Bigbone Lick, and for a considerable distance on both banks of the Ohio, above and below it, is composed of blue argillaceous limestone and marl, constituting one of the oldest members of the transition or Silurian system. The strata are nearly horizontal and form flat table-lands intersected by numerous valleys in which alluvial gravel and silt occur; but there is no covering of drift in this region. The drift is abundant in the northern parts of Ohio and Indiana, but disappears almost entirely before we reach the Ohio.

Until lately herds of buffaloes were in the habit of frequenting the springs, and the paths made by them are still to be seen. Numbers of these animals have been mired in the bogs, and horses and cows have perished in like manner. Along with their remains are found innumerable bones of Mastodon, Elephant, and other extinct quadrupeds, which must have visited these springs when the valley was in its present geographical condition in almost every particular, and which must have been mired in them as existing quadrupeds are at present. The mastodon remains are most numerous and belong to individuals of all ages. The mud is very deep, black, and soft. In places it is seen to rest upon the limestone, and at some points it swells up to the height of several feet above the general level of the plain and of the river. It is occasionally covered by a deposit of yellow clay or loam, resembling the silt of the Ohio, which is from 10 to 20 feet thick, rising to that height above the creek and often terminating abruptly at its edges. This loam has all the appearance of having been deposited tranquilly on the surface of the morass and of having afterwards suffered denudation. The Mastodon and other quadrupeds have been mired before the deposition of the incumbent silt, for a considerable number of fossil bones have been found by digging through it. Accompanying the bones are freshwater and land shells, most of which have been identified by Mr. Anthony with species now existing in the same region.

Mr. Lyell observes that the surface of the bog is extremely uneven, and accounts for it partly by the unequal distribution of the incumbent alluvium which presses with a heavy weight on certain parts of the morass, from which other portions of the surface are entirely free. He also attributes it in part to the swelling of the bog where it is fully saturated with water near the springs.

The author is of opinion that the fossil remains of Bigbone Lick are much more modern than the deposition of the drift, which is not present in this district. But although the date of the imbedding of these mammalian fossil remains is so extremely modern, considered geologically, it is impossible to say how many thousand years may not have elapsed since the Mastodon and other lost species became extinct. They have been found at the depth of several feet from the surface, but we have no data for estimating the

rate at which the boggy ground has increased in height, nor do we know how often during floods its upper portion has been swept away.

Ohio.—The Ohio river immediately above and below Cincinnati is bounded on its right bank by two terraces consisting of sand, gravel and loam, the lower terrace consisting of beds supposed to be much newer than those of the upper. In the gravelly beds of the higher terrace teeth both of the Mastodon and elephant have been met with. Mr. Lyell was assured that a boulder of gneiss, 12 feet in diameter, was found resting on the upper terrace, about 4 miles north of Cincinnati, and that some fragments of granite had been found in a similar situation at Cincinnati itself. These facts show that some large erratics have taken up their present position since the older alluvium of the Ohio valley was deposited. In travelling northwards from Cincinnati towards Cleveland, Mr. Lyell found the northern drift commence in partial patches 25 miles from the former city and about 5 miles N.E. of Lebanon, after which it continually increased in thickness as he proceeded towards Lake Erie.

New York—Niagara Falls.—In a former paper Mr. Lyell alluded to the position of the remains of Mastodon, 12 feet deep, in a freshwater formation on the right bank of the river Niagara at the Falls. He remarks that if we had not been able to prove that the cataract had receded nearly four miles since the origin of the fluviatile strata in question, we should have been unable to assign any considerable duration of time as having intervened between the inhumation of the Mastodon in marl full of existing shells and the present period. The general covering of drift between Lakes Erie and Ontario is considered to be of much higher antiquity than the gravel containing the bones of the Mastodon at the Falls.

Rochester.—In the suburbs of this city remains of the *Mastodon giganteum* were found associated with existing species of Mollusca in gravel and marl below peat.

Genesee.—Here remains of the *Mastodon giganteum* were found with existing shells in a small swamp in a cavity of the boulder formation, so that the animal must have sunk after the period of the drift when a shallow pond fed by springs was inhabited by the same species of freshwater mollusca as now live on the spot.

Albany and Greene Counties.—Mr. Lyell examined, in company with Mr. Hall, two swamps west of the Hudson River, where the remains of Mastodon occurred in both places at a depth of four or five feet, precisely in such situations as would yield shell marl, and peat, with remains of existing animals in Scotland. Cattle have recently been mired in these swamps.

According to Mr. Hall the greatest elevation at which Mastodon bones have been found in the United States is at the town of Hinsdale, situated on a tributary of the river Allegany in Cattaraugus county in the State of New York, where they occur at an elevation of 1500 feet above the level of the sea.

Maryland.—In the museum at Baltimore, Mr. Lyell was shown the grinder of a Mastodon, distinct from *M. giganteum*, and which

had been recognised and labelled by Mr. Charlesworth as *M. longirostris*, Kaup. It was found at the depth of 15 feet from the surface in a bed of marl near Greensburgh, in Carolina County, Maryland, and is considered by Mr. Lyell as a miocene fossil.

Atlantic border.—Between the Appalachian mountains and the Atlantic there is a wide extent of nearly horizontal tertiary strata, which at the base of the mountains are 500 feet and upwards in height, but decline in level nearer the ocean and at length give place to sandy plains and low islands skirting the coast, in which strata containing marine shells of recent species are met with, slightly elevated above the sea. Occasionally deposits formed in freshwater swamps occur, below the mean level of the Atlantic or overflowed at high tide. In this district Mr. Nuttall discovered, on the Neuse 15 miles below Newburn, in South Carolina, a large assemblage of mammalian bones, including those of the *Mastodon giganteum*, resting on a deposit containing marine shells of recent species. Mr. Conrad presented Mr. Lyell with the tooth of a horse covered with barnacles, from this locality. Professor Owen has examined it and could find no corresponding tooth of a recent species, but considers it as agreeing with the horse-tooth brought by Mr. Darwin from the north side of the Plata in Entre Rios in South America.

South Carolina.—Remains of the Mastodon were found in digging the Santee Canal, in a spot where large quadrupeds might now sink into the soft boggy ground.

Georgia.—Bones of the Mastodon and Megatherium occur in this district in swamps formed upon a marine sand containing shells of species now inhabiting the neighbouring sea.

Mr. Lyell in conclusion offers the following observations :—

1. That the extinct animals of Bigbone Lick and those of the Atlantic border in the Carolinas and in Georgia belong to the same group, the identical species of Mastodon and elephant being in both cases associated with the horse, and while we have the Mylodon and Megatherium in Georgia, the Megalonyx is stated by several authors to have been found at Bigbone Lick.

2. On both sides of the Appalachian chain, the fossil shells, whether land or freshwater, accompanying the bones of Mastodons, agree with species of Mollusca now inhabiting the same regions.

3. Under similar circumstances Mr. Darwin found the Mastodon and horse in Entre Rios, near the Plata, and the Megatherium, Megalonyx and Mylodon, together with the horse, in Bahia Blanca in Patagonia; these South American remains being shown by their geological position to be of later date than certain marine Newer Pliocene, and Post-pliocene strata. Mr. Darwin also ascertained that some extinct animals of the same group are more modern in Patagonia than the drift with erratics.

4. The extinct quadrupeds before alluded to in the United States lived after the deposition of the northern drift, and consequently the coldness of climate which probably coincided in date with the transportation of the drift, was not as some pretend the cause of their extinction.

BOTANICAL SOCIETY OF LONDON.

July 7th.—J. E. Gray, Esq., F.R.S. &c., President, in the Chair.

Read "Observations on *Dicranum Dillenii* (MSS. T. T.)," by Dr. Thomas Taylor.

As Dillenius is the first author who has directed the attention of botanists, seventy-five years ago, by a separate paper, to the present moss, his name has been ascribed to it, and yet it is plain that he, as well as all subsequent muscologists, have confounded it with *Dicranum Scoparium* (Linn.). Nor is this without excuse, when we consider the strong resemblance of the habit of both, their nearly equal size, their very general occurrence in Europe as well as in the northern parts of America, and particularly their frequently growing together in the same woods, or on the same banks, in more open and mountainous situations. Besides, the present plant varies very considerably in appearance, so that the one state well figured in 'English Botany,' t. 354, as *Dicranum Scoparium*, would scarcely be supposed to belong to the same species as another state equally well represented by Schwægrichen in his 'Supplement,' t. 42, under the same name. It is the wide limits within which its aspect changes that probably weighed with the editors of the 'Muscologia Britannica' to give both species, well represented, as varieties only of *Dicranum Scoparium*. Submitted, however, to a rigid scrutiny, Dr. Taylor apprehended that the following distinctive marks would be found to be constant; and if so, they would appear to be both sufficiently numerous and sufficiently grave to establish the present species.

1. *Dicranum Dillenii*, though frequently differing in size, is usually the smaller moss. 2. Its leaves are not constantly and but slightly turned to one side, while in *Dicranum Scoparium* they are more loosely set and uniformly falcato-secund. 3. In the present the pedicels are solitary, in the other aggregated within the same *perichætium*. 4. In the former the pedicels are opake, even immediately below the capsule at the period of full maturity; they are reddish below and brownish-yellow above; while in the latter, even when full-grown, they are somewhat pellucid and of a pale straw-colour. 5. In the former the capsule is erect below and slightly curved above, is nearly equal, has no projecting *struma* yet, with an apophysis pale brown when ripe; in the latter the capsule is curved even long before the fall of the *calyptra*, is very unequal, has a projecting *struma*, and is green when just ripe. 6. In the former the *operculum* is gradually acuminated and falls after the *calyptra*; while in the latter the *operculum*, with a broad base, is suddenly acuminated, and usually falls on and with the *calyptra*. 7. In *Dicranum Dillenii* the teeth of the peristome are narrower and more opake. 8. The stem is often interruptedly leafy. 9. The leaves are shorter, and have their points less curved. 10. The parts of fructification are greater in proportion to the size of the plant.

In the museum of the Society occurs a *Dicranum* from Newfoundland, from the late Mr. Lambert's herbarium, which being barren, and so not admitting of a comparison of the parts of fructification,

Dr. Taylor would not venture to separate from *Dicranum Dillenii*, and yet its densely aggregated and shorter stems, its shining lustre and its less patent leaves, would demand the greatest attention, and would indicate it as at least a very remarkable variety; but when we consider its leaves shorter, wider in the lower half, and their points more canaliculate, with their nerve serrated at the back, it must be confessed its claims to be separated are very strong.

BOTANICAL SOCIETY OF EDINBURGH.

This Society held its last meeting for the season on Thursday, July 1843. President, Dr. Neill, in the Chair.

The following papers were then read :—

1. "On the genera *Gomphonema* and *Meridion*," by Mr. John Ralfs, Penzance*.

2. "On four new species of British *Jungermanniæ**," by Thomas Taylor, M.D., Dunkerron.

3. "On a species of *Fungus* found imbedded in Peat, near Stirling." Communicated by Mr. Peter Mackenzie, West Plean.

The attention of botanists has recently been directed to the importance of studying the vegetable remains imbedded in peat-mosses, as calculated to throw light on the early vegetation of the country, and the successive changes it has undergone. For this object, communications like that from Mr. Mackenzie are much to be desired.

A letter was also read from Dr. Joseph Dickson, St. Helier's, Jersey, mentioning some interesting additions to the flora of that island which he had lately discovered, and remarking, that he felt convinced it contains many other species still unknown to botanists.

ZOOLOGICAL SOCIETY.

October 11, 1842.—R. H. Solly, Esq., in the Chair.

A paper, "On the Blood-corpuscles of some of the *Struthionidæ*," by George Gulliver, Esq., was read.

I had lately an opportunity of examining the blood of a young Ostrich, killed by accident in the Society's menagerie. The following measurements of the corpuscles are expressed in vulgar fractions of an English inch :—The average length of the discs = 1-1649 inch, average breadth of the discs = 1-3000 inch, thickness of the discs = 1-9166 inch : dimensions of the nuclei, exposed by dilute acetic acid—length = 1-3200 inch, breadth = 1-9166 inch, diameter of the pale globules of the blood = 1-3329 inch.

I have given several measurements of the blood-discs of the Emu and of the Rhea in the 'Appendix to Gerber's Anatomy,' p. 77, from which the following averages are taken :—

Emu (*Dromaius Novæ-Hollandiæ*, Vieill.).

Length.	Breadth.
1-1690	1-3031

* These papers will be subsequently given at full length in this Journal. —Ed.

American Ostrich (*Rhea Americana*, Briss.).

Length.	Breadth.
1-1898	1-3273

A comparison of these measurements will show that the blood-discs of the common Ostrich are slightly larger than those of the Emu and of the Rhea.

Mr. Fraser laid before the Meeting some new species of Birds, constituting part of his collection formed at Fernando Po, and characterized them as follows:—

Platysteira castanea. *Platys. vertice genisque cinereis, mento albo; dorso, alis superne, gulâ et pectore castaneis; abdomine albo, appendiculis carnosis circum oculos rubris; rostro nigro iridibus rufescenti-fuscis; tarsis cæruleo-purpurescentibus.*

Inter sexus haud coloris diversitas.

Long. tot. $3\frac{5}{10}$ unc.; rostri, $\frac{6}{10}$; alæ, $2\frac{2}{10}$; caudæ, $\frac{8}{10}$; tarsi, $\frac{5}{10}$.

Hab. Clarence, Fernando Po.

Found among the branches of the naked trees in June, sometimes in pairs; they are short and thick in form, the feathering being of downy nature. Its note is short.

This bird differs from Jardine and Selby's *Platyrhynchus Desmarestii*, Ill. Orn., vol. i. pl. 9. fig. 2, in having the chestnut back and wings and the short black tail.

Platysteira leucopygialis. *Platys. (mas) capite, genis, collo, dorso, alis, caudâ et vittâ latâ pectorali, sic et femoribus e cæruleo nigris, uropygio, gulâ et abdomine albis.*

Long. tot. 4 unc.; rostri, $\frac{6}{10}$; alæ, $2\frac{2}{10}$; caudæ, $\frac{9}{10}$; tarsi, $\frac{6}{10}$.

Hab. Clarence, Fernando Po.

Found in the same situations as *P. castanea*.

Fleshy appendages around the eye, red; irides, red hazel; bill, black; legs, purplish: the gizzard contained insects.

This bird differs from Jardine and Selby's *Platyrhynchus collaris*, Ill. Orn., vol. i. pl. 9. fig. 1, in having a white rump, the wings entirely black, the band across the chest much broader, and the fleshy appendage around the eye red.

Ploceus collaris. *Ploc. vertice, capitis lateribus, et mento, nigris, torque collari lato, castaneo; rostro nigro, tarsis fuscescentibus, reliquis partibus aurantiaco, olivaceo et fuscescente variegatis, ferè ut in* Ploceo textore (*vide* Ploceus Textor, *Swains.*).

Long. tot. $7\frac{5}{10}$ unc.; rostri, $1\frac{2}{10}$; alæ, 4; caudæ, $3\frac{1}{2}$; tarsi, $1\frac{1}{10}$.

Hab. apud Insulam St. Thomas, Afric. occid.

This bird differs from *P. textor* in being of a greater size, in having the chestnut collar *encircling* the neck, and the general colouring of the body being less vivid.

Euplectes rufovelatus. *Euplec. (mas) vertice et nuchâ, nitidè rubris, colore rubro in latera colli ducto; corpore in toto nigro, iridibus e corylo rubris, tarsis et rostro nigris.*

Long. tot. 7 unc.; rostri, 1; alæ, 4; caudæ, $2\frac{5}{10}$; tarsi, 1.

Hab. Clarence, Fernando Po.

A very good songster. These birds, although in deep moult (in June), appeared to be pairing. One specimen was shot from the top of a very lofty tree, the others much nearer the ground. In an apparently young male the black extends across the forehead.

October 25.—William Yarrell, Esq., Vice-President, in the Chair.

Prof. Owen exhibited a specimen of the Pearly Nautilus (*Nautilus Pompilius*), animal and shell, obtained by Capt. E. Belcher, R.N., at Amboina. Prof. Owen alluded to the fact of the specimen described by him in 1832 having been detached from the shell, which was destroyed in its capture, and to the analogies which had guided him in determining the position in which he had restored the soft parts to the shell, and figured them, *in situ*, in his memoir. Objections had been made to this restoration by Mr. Gray* and by Dr. Grant† and De Blainville‡, who were led by other analogies to believe that the upper or outer lip of the shell must have crossed the back of the head, instead of crossing the opposite side or funnel, as represented by Mr. Owen. M. Valenciennes, who had subsequently received the soft parts of a *Nautilus*, had adopted the position assigned to them in the shell by Mr. Owen.

The present example, in which the animal had been restored by Capt. Belcher to its shell in precisely the same position in which it was received by him, when recent, closely agreed with the description and figure in Prof. Owen's work§. The involuted spire of the shell is covered by the dorsal fold of the mantle, and is lodged in the concavity at the back of the muscular plate above the head. The funnel rests upon the outer wall of the large chamber containing the animal.

A paper by G. B. Sowerby, Esq., Jun., containing descriptions of two new species of shells belonging to the genus *Strombus*, was then read. The specimens were collected by the Society's Corresponding Member, H. Cuming, Esq., in the Philippine Islands, and exhibited by that gentleman to the Meeting.

Strombus crispatus, Sow. Jun., Thes. Conch. part i. pl. 8. f. 62, 63. *Str. testâ turritâ, fusiformi, concentricè plicatâ, spiraliter striatâ; aperturâ ovali, posticè in canalem brevem crispatam desinente; anticè canali brevi rostratâ; labio externo crasso, crenulato; labio interno crasso; operculo lateraliter serrato.*

Long. 1·5; lat. 0·40 poll.

Hab. Ins. Luzon, Panay, et Bureas, Philippinarum. H. Cuming legit.

A finely sculptured species resembling the well-known *Str. fissurella*, but rather more ventricose, with the edges of the posterior canal free, rather short, and coiled at the extremity. The colour is pale straw, with three brown bands across the body whorl.

* Phil. Trans. 1833, p. 774. † Lancet, Dec. 28, 1833, pp. 506, 509.

‡ Nouvelles Animales du Muséum, tom. iii. p. 7.

§ Memoir on the *Nautilus Pompilius*, 4to, 1832; published by the Royal College of Surgeons.

Strombus bulbulus, Sow. Jun., Thes. Conch. part i. pl. 9. f. 81, 82, 83. *Str. testâ ovali oblongâ, lævi, spirâ brevi; anfractu ultimo anticè obliquè truncato; aperturâ internè usque ad marginem striatâ; labio externo vix expanso, paululùm incrassato; sinu antico invalido; labio interno valido.*

Long. 1·45; lat. 0·60 poll.

Hab. Ins. Philippinæ. H. Cuming legit.

This species differs from *S. Terebellatus* in being more ventricose, in having the striæ in the aperture extended to the outer margin, and in having the inner lip more distinct.

Mr. Fraser communicated to the Meeting the following descriptions of new species of Birds, constituting part of the collection he had formed in the Niger expedition:—

Pelecanus rufescens, Gmel., vol. i. part 2. p. 571. sp. 13; Lath. Gen. Hist., vol. x. p. 404. sp. 8; Rüpp. Atlas, vol. ii. taf. 21.

This specimen was killed at Egga, in which place it was seen in large flocks in the month of October. This was the highest point to which the Niger expedition ascended. The specimen in question was killed by the late W. C. Willie, Esq., mate of H.M.S.V. Albert, and presented to Mr. Fraser by Lieut. J. W. Fairholme, R.N., of the same expedition.

Sylvia badiceps. *Sylv. (mas) vertice cinnamomino, plumis auricularibus et corpore superiore cinereis; alis caudâque e cinereo fuscis; genis gulâ, tectricibusque alarum inferioribus albis; fasciâ pectorali nigrâ; corpore inferiore cinereo, apud medium pallidiore. Iridibus e corylo-fuscis tarsis flavis.*

Long. tot. $3\frac{10}{12}$ unc; rostri, $6\frac{2}{12}$; alæ, $2\frac{2}{12}$; caudæ, $1\frac{6}{12}$; tarsi, $\frac{8}{12}$.

Hab. Clarence, Fernando Po.

A small beetle was found in the stomach.

Coccothraustes olivaceus. *Coccoth. capite, collo, pectore, dorso, alarum tectricibus, corporisque lateribus saturatè olivaceo-viridibus; hôc colore ad uropygium, femora et caudam, tectricibus alarum inferioribus, secundariis, rectricumque caudæ apicibus flavis; primariis nigris, ad apicem flavescenti-albis; secundariis in mediâ parte nigris, ad marginem internum albis, ad apicem flavescentibus; rostro tarsisque flavis.*

Long. tot. $7\frac{1}{4}$ unc.; rostri, $\frac{1}{2}$; alæ, $2\frac{3}{4}$; caudæ, 2; tarsi, $\frac{8}{12}$.

Hab. Clarence, Fernando Po.

Nigrita fusconotus. *Nigr. capite, collo, tectricibus caudæ, sic et rectricibus nitidè nigris; dorso, et plumis scapularibus cinereo-fuscis; alis nigrescentibus; corpore inferiore sordidè albo, rostro tarsisque nigris, iridibus e corylo-fuscis.*

Long. tot. $4\frac{1}{4}$ unc.; rostri, $\frac{1}{2}$; alæ, $2\frac{1}{4}$; caudæ, 2; tarsi, $\frac{1}{2}$.

Hab. Clarence, Fernando Po.

Mr. Fraser stated it as his opinion that the bird above described belonged to the *Fringillidæ*. It certainly appertains to the genus characterized by Mr. Strickland in the 'Proceedings' for April 1841, p. 30, under the title *Æthiops*. This genus was founded upon a bird

(*Æthiops canicapillus*) also from Fernando Po, specimens of which Mr. Fraser had obtained and exhibited to the Meeting. Finding the generic name *Æthiops* had been previously used for a genus of Monkeys, Mr. Fraser had been requested by Mr. Strickland to substitute for it the new generic title *Nigrita*. The species described by the gentleman last mentioned will therefore stand as *Nigrita canicapillus*, Strickl.

Amadina Poensis. *Amad. nitidè nigra, primariis guttatis, secundariis uropygio, plumisque lateribus albo-fasciatis; abdomine, tectricibus alarum inferioribus, crissoque albis; iridibus e corylo-fuscis; rostro cæruleo; tarsis nigris.*

Long. tot. 4 unc.; rostri, $\frac{3}{8}$; alæ, 2; caudæ, $1\frac{1}{2}$; tarsi, $\frac{1}{2}$.

Hab. Clarence, Fernando Po.

Very common about Clarence, in flocks of about fifty; their note is 'tweet-tweet.' The young have a brownish cast; they feed entirely upon seeds of the three-forked grass. The sexes do not differ.

Amadina bicolor. *Amad. (mas) corpore superiore, pectore, et lateribus nigris; abdomine, tectricibus alarum inferioribus, crissoque albis; rostro cæruleo; tarsis nigris.*

Fœm. vel Jun.: colore fusco, fronte genis, gulâque nigrescentibus; lateribus et uropygio indistinctè albo-fasciatis.

Long. tot. 4 unc.; rostri, $\frac{3}{8}$; alæ, 2; caudæ, $1\frac{1}{2}$; tarsi, $\frac{1}{2}$.

Hab. apud promontorium Cape Palmas dictum.

A third specimen, which is smaller, is entirely brown, without any indication of the white marks.

Common in the roofs of the huts belonging to the fish-men of Cape Palmas, in which situation they breed and commit much mischief, like our domestic sparrow (*Pyrgita domestica*, Cuv.). The native name is *Saybue*.

This differs from *Amadina Poensis* in the absence, in the adult, of the white markings on the wings, rump, and sides.

Mr. Waterhouse exhibited and described two new species of Mouse, one collected in the Philippine Islands by H. Cuming, Esq., and the other forming part of Mr. Gould's Australian collection.

Mus castaneus. *Mus intensè castaneus, corpore subtùs pallidiore; caudâ corpore cum capite longiore; auribus mediocribus.*

	unc.	lin.
Longitudo ab apice rostri ad caudæ basin. . . .	2	7
——————— ad basin auris	0	8
——————— *tarsi digitorumque*	0	$7\frac{1}{2}$
——————— *auris*	0	$4\frac{1}{2}$
——————— *caudæ*	3	0

Hab. ad Insulas Philippinarum.

This little mouse is remarkable for its nearly uniform deep and rich chestnut-brown colour, at least such is the tint it presents in spirits; the under parts of the body are rather paler than the upper; the feet and tail are uniform in hue with the body. Compared with the common mouse (*M. musculus*), it differs in being smaller, in having the rostrum more slender, and the tail proportionately longer.

Mus Novæ-Hollandiæ. *Mus suprà canus flavescente-lavatus; corpore subtùs pedibusque albis; auribus mediocribus; caudâ quoad longitudinem corpus ferè æquante.*

	unc.	lin.
Longitudo ab apice rostri ad caudæ basin....	3	0
——— caudæ, circiter	2	0
——— *tarsi digitorumque*	0	9¼

Hab. New South Wales.

This mouse was found, together with two young specimens, under a large slab of bark at Yarrundi, Upper Hunter, New South Wales. In size and colouring it approaches most nearly to the *Mus sylvaticus*, but its tail is considerably shorter than in that animal. In the form of the skull the present species also approaches the *M. sylvaticus*, but the nasal portion of the cranium is shorter; the molar teeth are of the same structure, but apparently rather larger in proportion. The fur is rather long and very soft; on the upper parts the hairs are of a deep grey colour, tipped with brownish yellow; on the belly the hairs are of a less deep grey colour next the skin, and white externally. The tarsi are rather long and slender. The tail is white beneath and dusky above.

November 8.—R. C. Griffith, Esq., in the Chair.

An extract of a letter from the Society's President, the Earl of Derby, was read. His Lordship observes, with reference to some young Rheas hatched in the menagerie, that the eggs were laid in one of his Lordship's paddocks, and were collected into a nest by the male bird, who sat upon them very perseveringly until the keeper, thinking the spot selected was too exposed, removed the eggs and placed them under some Turkeys. They were ultimately, however, placed in Mr. Appleyard's hatching apparatus, and in about a week or ten days were hatched. The letter moreover announces the safe arrival of three Elands (*Antilope Oreas*, Pall.) in his Lordship's menagerie.

A memoir on the anatomy of a species of *Calyptræa* with a ventral shelly valve (*Lithedaphus longirostris*, Ow.), by Prof. Owen, was then read. The normal valve secreted by the *Lithedaphus* resembles a *Calyptræa*, and indeed is possibly a variety of the *Calyptræa equestris* of authors; but the animal is inclosed, like the Acephalous Mollusks, in a bivalve shell. The additional plate, in the present instance, Professor Owen shows to be connected with a modification in the organization of the animal which establishes its claim to a subgeneric distinction among the *Calyptræidæ*. The specimens dissected were collected by H. Cuming, Esq. in the Philippine Islands, and the circumstances connected with this discovery are recorded by that gentleman in the 'Conchologia Systematica' of Mr. L. Reeve (vol. ii. p. 31).

"*Lithedaphus* differs from all previously described *Calyptræidæ* in some well-marked external characters of its soft parts. The head, instead of being short, broad and flat, is long and subcylindrical;

the part anterior to the tentacles being produced in the form of a proboscis, equalling in length the whole body behind it, and terminated by a clavate extremity. The tentacles or antennæ are of proportional length, reaching, in some specimens, to the beginning of the terminal expansion of the proboscis. The second external character is a moderately long subcompressed process, projecting forwards between the head and the anterior margin of the foot, like a second head, but consisting only of a soft duplicature of the mantle, with muscular fibres for protraction and retraction. In some specimens the apex of this process was expanded and a little produced on each side.

"The foot, in the specimens examined, was much smaller in proportion than in *Calyptræa* or *Calypeopsis*; it presents a subcircular form, as in *Cal. Sinensis*, but only equals half the diameter of the entire body*; its whole margin is free, not produced anteriorly into lobes, as in *Calypeopsis*. The dorsal surface of the mantle is impressed with a deep horse-shoe fissure, receiving the internal plate of the upper shell. The aperture of the branchial chamber extends transversely across the back of the head, but conducts to a cavity of unusually small extent. The contained breathing organs differ not merely in relative size, but likewise very remarkably in structure, from the previously dissected *Calyptræidæ*. In these the branchiæ consist of a single series of simple, elongated, close-set and very numerous filaments, extending along the left side of the body in *Calyptræa Sinensis*, and making the tour of the mantle in the *Calypeopsis*. In *Lithedaphus* the branchiæ consist of two short parallel rows of conical, subcompressed, plicated vascular processes, twelve to fourteen in each row, and limited, like the branchial cavity, to the anterior part of the dorsal aspect of the body. The heart, lodged in a wide pericardium, and consisting of a large auricle with thin, subtransparent walls, and a small, opake, conical ventricle, is situated at the left extremity of the branchial chamber, receiving the branchial veins, and sending its largest artery to the ovarium, which, in the specimen dissected, formed the left portion of the visceral mass. The oviduct, at first slender and convoluted, expands on the right side, where it is disposed in three long folds, which were laden with unusually large elliptical ova. At its termination, close to the branchial orifice, there is an oval mucous gland, and a short conical filament projects from the inner surface of the mantle. The proboscis is surrounded by a thick muscular tunic, inclosing a long, rasp-

* It is here described as contracted in specimens preserved in spirit, the specimens of *Calyptræa* and *Calypeopsis* compared with it being in the same state. It is, doubtless, expanded in the living animal, as a thin, muscular and secreting disk over the basal plate. Much sharp criticism has been expended on the genus *Gastroplax*, De Blainville. It was founded in error, no doubt; but future conchologists, who may be tempted to cast a reflection on its author, should remember that he has rendered services to Conchology such as few can hope to rival, and will do well to bear in mind, that the secretion of a shelly valve by the foot of a gastropod is not only a possibility, but is a reality in nature.

like, horny tongue, and at its base are two simple salivary follicles. The œsophagus expands into a small stomach, imbedded in a follicular liver. The intestinal canal is more complicated than in *Calyptræa* or *Calypeopsis*; it bends towards the left side, and there forms a small mass of double spiral coils, five or six in number, from which the rectum is continued along the floor of the branchial chamber, in the interspace of the gills, to the outlet of that chamber on the right side of the neck.

"The nervous system is chiefly distinguished from that of the *Calypeopsis* by the larger relative size and closer approximation of the supra-œsophageal ganglions, which here equal the inferior masses. Besides the chords connecting the upper with the lower ganglions, the upper ganglions give off each three nerves: the largest runs forward in a zigzag course to the clavate mouth; the second supplies the substance of the tentacle; the third, a slender nerve, goes to the minute eye-speck on the outer side of the base of the tentacle. The wavy disposition of these nerves, especially of the rostral pair, clearly indicates a provision for considerable elongation of the parts which they supply.

"Thus the genus *Lithedaphus* differs from the other known forms of the *Calyptræidæ* in the smaller development of its locomotive and respiratory organs, and in the greater development of the organs for the prehension and assimilation of food.

"Probably no oyster, cemented to its native rock, is more fettered in its movements than this highly developed gastropod, to which, however, a voluntary detachment of the foot from the gastric plate may be possible. M. Dufo however testifies that the only movement he was able to recognise in his *Calyptræa Roissii* was an elevation of the anterior part of the shell, and a corresponding separation of it from the supporting plate beneath.

"The circumstances under which Mr. Cuming discovered his specimens would hardly be consistent with a greater extent of motion. The foot, therefore, whose normal functions as an instrument for traversing space must be restricted to the early age of the *Lithedaphus*, may well offer diminished proportions when the animal has chosen a site for the deposition of its ventral plate and has taken up a fixed abode. Muscular action being thenceforward much restricted, the necessity for extensive respiration is in the same degree abolished. The compensation for this abrogation of the power of moving about in quest of food is obviously the great development of the proboscidiform head, which, when outstretched in the living mollusk, must appear like some worm moving to and fro from between the valves of the shell. The tactile organs of sense are co-extended with the prehensile organ; but the eyes, so useful to the young wandering mollusk, have much shrunk in the sedentary aged; and the complete elaboration of whatever nutriment may be introduced into the system has been provided for by the long and convoluted alimentary canal.

"These facts in the anatomy of the *Lithedaphus*, and their harmonious adjustment to its peculiar condition as a sessile gastropod inclosed in a bivalve shell, leave scarcely any doubt as to this state,

strange and anomalous though it may seem, being essential to its nature and of original design.

"For assuming that the secretion of a ventral plate may be excited by some accidental position of an individual of a species not commonly possessing such plate, it would be an extreme hypothesis to attribute to the consequent abrogation of the locomotive power a gradual and progressive elongation of the head, during successive endeavours on the part of the imprisoned mollusk to attain whatever food might come within its reach.

"And admitting that, the supplies of food being casual and scanty, the nutriment would require to be longer retained and more completely assimilated, to conclude that the alimentary canal thereupon acquired additional convolutions, would be still more hazardous. But when we find that, the demands upon the respiratory actions being much diminished after the loss of locomotion, the branchial apparatus does not merely present an atrophied state of its usual structure in the free *Calyptræidæ*, but a different condition of that structure,—two very short gills replacing one very extensive one, and the form of the branchial filaments being quite different,—the conclusion seems unavoidable, that the *Litheduphus* is a good and constant genus, created with reference to that peculiar mode of life to which its bivalve shell and other generic characters as a Calyptræidan are correlated."

The next paper read was also from Prof. Owen, and contains an account of the anatomy of the *Pholadomya candida*. The genus *Pholadomya* was founded by G. B. Sowerby, upon certain peculiarities observable in the structure of a shell which in some of its characters approaches the genera *Solen*, *Pholas*, and *Mya*. The animal exhibits the ordinary characters of the *Acephala inclusa* of Cuvier, being everywhere shut up in a mantle which gives issue only to the siphonic tube and the foot; it presents, however, in addition to the pedal and the two siphonic apertures, a fourth orifice, at the under part of the siphon, which is of small size and circular form. This orifice alone, observes Prof. Owen, is sufficient to distinguish the present mollusk from any known genus of the *Inclusa*. It would seem to be an inlet for respiratory currents, supplementary to the ordinary ventral siphon. The animal, compared with that of the *Panopæa australis*, the characters of which are detailed by M. Valenciennes, is distinguishable not only by an accessory bifurcate foot and valvular aperture, but by its undivided branchiæ and some other less marked characters; nevertheless the affinity to *Panopæa*, as indicated by the hinge of the shell, is illustrated by a closer general resemblance of its soft parts to that genus than to *Mya*, *Solen*, or *Pholas*. These two papers, from the pen of Prof. Owen, and of which the above is a brief abstract, are illustrated with beautifully executed drawings.

Dr. Pfeiffer's descriptions of new species of Shells collected by H. Cuming, Esq. in the Philippine Islands, were then read.

Helix cromyodes. *Hel. testâ imperforatâ, depresso-globosâ,*

tenuissimâ, pellucidâ, olivaceo-fulvâ, apice violaceâ; anfractibus 4 planiusculis, ultimo magno, medio fasciâ latâ albâ cingulato et epidermide tenuissimâ cinerascente fasciatim ornato; columellâ perobliquâ, latâ, albâ; aperturâ lunato-ovali; peristomate simplici, expanso, margine rufo-violascente.

Diam. 1½ poll.; altit. 10½ lin.

Hab. Cagayan, province Misamis of the island Mindanao. Found on leaves of trees.

Helix languida. *Hel. testâ imperforatâ, globosâ, tenuiusculâ, regulariter et confertim obliquè striatâ, apice obtuso lutescente, anfractu ultimo rufo, epidermide hydrophanâ cinerascente indutâ albo-lineolatâ, basi nudo, nitido; suturâ lineâ fuscâ nitidâ, notatâ; anfractibus 4½ convexiusculis; columellâ verticali, albo-callosâ; aperturâ subovali; peristomate . . . . ?*

Diam. et altit. 15 lin.

Two specimens only were found, not yet perfect, on leaves of palms in the island of Siquijor. These resemble some of the varieties of *Bulimus metæformis*, but are more globular.

Helix Bulla, Pf. an Nanina? *Hel. testâ subperforatâ, globoso-depressâ, tenuissimâ, pellucidâ, striis confertis spiralibus et obliquis minutissimè decussatâ, subcarinatâ, pallidè fulvâ, ad carinam rufo-cingulatâ; suturâ vix impressâ; spirâ parùm exsertâ; anfractibus 4 planiusculis; aperturâ lunato-rotundatâ, intùs margaritaceâ, unifasciatâ; peristomate simplici, margine supero introrsùm flexo, columellari vix expanso.*

Diam. 1·60; altit. 0·90 poll.

Hab. Provincia Albay insulæ Luçon.

In form it resembles *Nanina bistrialis*, Beck.

Helix phloiodes. *Hel. testâ imperforatâ, depressâ, solidâ, sub epidermide corticinâ (strigis saturatioribus variegatâ), nitidè nigricanti-rufâ; spirâ subplanulatâ; suturâ profundâ; anfractibus 4½ convexis; columellâ subrectâ, perobliquâ, subexcavatâ; aperturâ latè lunari, intùs lividâ; peristomate incrassato, reflexo, fusco.*

Diam. 14½; altit. 9 lin.

Hab. Argao (island of Zebu): on leaves of trees.

Helix tephrodes. *Hel. testâ imperforatâ, subglobosâ, solidâ, ponderosâ, supernè rufâ, strigis latis epidermidis cinereæ hydrophanæ ferè obductâ, basi stramineâ, rufo-fasciatâ; anfractibus 4½ convexis, supremis depressis, denudatis, rufescentibus; columellâ latâ, albâ, subarcuatâ; aperturâ lunato-orbiculari, intùs albâ; peristomate simplici, reflexo.*

Diam. 19; altit. 15½ lin.

Hab. Sual (province of Pangasinan, Luçon): on leaves of bushes.

Helix unica. *Hel. testâ imperforatâ, globosâ, solidiusculâ, obliquè striatulâ, albidâ; suturâ profundâ; anfractibus 5½ inflatis, supremis planiusculis; columellâ profundè intrante, arcuatâ, subcanaliculatâ; aperturâ perobliquâ, suborbiculari, intùs albâ; peristo-*

mate latè expanso, basi incrassato, intùs fulvido, marginibus approximatis.

Diam. 19; altit. 14½ lin.

Hab. Samboanga, of the island of Mindanao.

This species, of which no more than one specimen was found, is very similar to *Hel. mammilla*, figured by Férussac and by Quoy and Gaimard, but the shell is almost smooth and quite imperforated.

Bulimus cochliodes. *Bul. testâ imperforatâ, turritâ, solidâ, obliquè irregulariter striatâ, apice obtusiusculâ, albidâ; suturâ impressâ; anfractibus 9 planiusculis; ultimo ¼ longitudinis æquante; columellâ subincrassatâ; aperturâ oblongo-ovali; peristomate simplici, recto.*

Long. 2 poll.; diam. 6 lin.

One specimen was found at the island of Cuyo.

Bulimus Cuyoensis. *Bul. testâ subperforatâ, ovato-pyramidatâ, glabriusculâ, nitidulâ, cinnamomeo-fulvidâ, strigis flexuosis pallidioribus et fasciâ unicâ rufescente ornatâ; suturâ lævi; anfractibus 5½ planiusculis, ultimo ⅓ longitudinis vix superante; columellâ brevi, incrassatâ, latè reflexâ; aperturâ ovali; peristomate tenui, parùm expanso.*

Long. 15; diam. 7½ lin.

Hab. Island of Cuyo. One specimen was found, on leaves of trees.

Bulimus effusus. *Bul. testâ imperforatâ, ovatâ, solidiusculâ, obliquè minutissimè striatâ, nitidâ, albâ; anfractibus 5 convexiusculis, ultimo spiram vix æquante; columellâ obliquâ, dilatatâ; aperturâ perobliquâ, lunato-ovali; peristomate simplici, valdè expanso.*

Long. 19½; diam. 14 lin.

Hab. Island of Tablas.

β. Anfractu ultimo subtùs fasciâ 1 fulvâ ornato.

This species resembles somewhat the *Bul. Cumingi*, but it differs in having the shell more solid, the aperture more oblique, the columella oblique and simple, and the last whorl shorter.

Bulimus macrostoma. *Bul. testâ imperforatâ, ovatâ, solidiusculâ, rufo-nigricante, apice pallidiore, epidermide hydrophanâ fuscâ indutâ, lineis nigris circumdatâ; anfractibus 6 convexiusculis, ultimo spiram subæquante; columellâ verticali, dilatatâ, medio subincrassatâ; aperturâ latâ, lunato-ovali, intùs albâ; peristomate expanso, subincrassato, intùs saturatè fusco, margine dextro valdè arcuato.*

Long. 30½; diam. 19½ lin.

Hab. Dolores, province of Pampanga, in the island of Luçon: found on trunks of trees.

β. Anfractu ultimo medio bifasciato, fasciâ superiore angustâ, nigrâ, alterâ adnatâ latiore, albidâ.

Long. 34; diam. 22½ lin.

From Sual (island of Luçon): on leaves of trees.

Bulimus Romblonensis. *Bul. testâ imperforatâ, ovato-pyramidatâ,*

tenui, striis obliquis et transversis confertis obsoletè decussatâ, albidâ, rufo-trifasciatâ, epidermide hydrophanâ deciduâ, liberâ, præsertìm in fasciis, maculatâ; anfractibus 6½ planiusculis, ultimo ⅓ longitudinis vix superante; columellâ subrectâ, angustâ, planatâ; aperturâ ovali; peristomate simplici, subexpanso.

Long. 2 poll.; diam. 11½ lin.

Hab. The island of Romblon, on leaves of trees. It is perhaps an *Achatina*.

Bulimus solidus. *Bul. testâ imperforatâ, ovato-oblongâ, solidâ, obliquè striatâ, saturatè rufâ, epidermide fusco-albâ irregulariter strigatâ; spirâ conicâ, sursùm pallescente; anfractibus 7 vix convexiusculis, ultimo spirâ paulò breviore; columellâ rectâ, basi subintortâ; aperturâ auriformi, lateraliter subeffusâ, intùs albidâ; peristomate subreflexo, intùs rufo-nigricante, marginibus callo lato tenui junctis.*

Long. 41; diam. 21½ lin.

Hab. S. Juan, province of Cagayan (island of Luçon).

Var. testâ magis inflatâ, anfractu ultimo medio albido-fasciato.

Long. 39; diam. 22½ lin.

Hab. Sual, province of Pangasinan (island of Luçon).

Bulimus subcarinatus. *Bul. testâ imperforatâ, pyramidatâ, tenui, striis obliquis et spiralibus confertissimis minutè decussatâ, albidâ, diaphanâ, epidermide fuscescente, hydrophanâ irregulariter strigatâ, ad suturam fasciâ pallidè fulvescente ornatâ; anfractibus 6½ planiusculis, ultimo ⅔ longitudinis subæquante, obsoletè carinato; columellâ rectâ, planâ, angustâ; aperturâ oblongo-subtetragonâ, intùs albâ; peristomate simplici, parùm expanso.*

Long. 22½; diam. 12½ lin.

Hab. The island of Romblon, on leaves of trees.

Bulimus uber. *Bul. testâ imperforatâ, ovatâ, apice obtusâ, tenui, subdiaphanâ, lutescenti-albidâ, obliquè regulariter et confertìm striatâ; spirâ semiglobosâ; suturâ impressâ, albo-marginatâ; anfractibus 4 inflatis, ultimo spiram superante; columellâ subrectâ, propè basin subincrassatâ; aperturâ ovali; peristomate simplici, latè expanso.*

Long. 24½; diam. 16 lin.

Hab. The island of Guimaras, on leaves of trees.

Bulimus virens. *Bul. testâ imperforatâ, ovato-pyramidatâ, tenui, lævisculâ, nitidâ, albâ, anfractu ultimo pallidè viridi; anfractibus 7 planiusculis, ultimo ⅓ longitudinis vix superante, obsoletè angulato; columellâ subrectâ, propè basin subincrassatâ, albâ; aperturâ obliquâ, lunato-ovali; peristomate recto, vix incrassato.*

Long. 27; diam. 14½ lin.

Hab. Island of Burias: on leaves of trees. In form it resembles *Bul. carinatus*, Lea.

November 22.—William Yarrell, Esq., Vice-President, in the Chair.

The following paper, by M. C. A. Récluz, entitled "Descriptions of various species of *Navicella*, collected by Mr. Cuming in the Phi-

lippine Islands," was communicated by H. Cuming, Esq., Corresponding Member, who exhibited specimens to the Meeting in illustration of the descriptions.

The longitudinal diameter of the *Navicellæ* described in this catalogue has been taken from the anterior to the posterior side, and the transverse diameter from the summit to the base of the external opening, in its broadest part.

1. Navicella Janelli, *Récluz*, Revue Cuviérienne, 1841. p. 376. No. 9.

Var. α. *Testâ elliptică, convexâ, crassiusculâ, vix cancellatâ, lineis nigris reticulatâ, interstitiis lutescentibus.*

Var. β. *T. lineis nigris supernè reticulatis, anticè remotiusculis, subæquidistantibus; aperturâ margine cinereo-nigrescente, in fundo aurantiâ, interdum nigro-maculatâ.*

Var. γ. *T. dorso nigro latè pictâ et maculis concoloribus variegatâ, anticè lineis nigris radiatâ, posticè densè lineolatâ; labio lateraliter emarginato, medio subproducto ac rectiusculo.*

Var. δ. *T. lutescente, dorso transversim latè et remotè nigro undatâ; zonis interdum anticè conico-angulatis.*

Var. ε. *T. orbiculari, dorso nigerrimâ, maculis lutescentibus sparsis notatâ, margine brevè lineatâ, posticè lateraliter, interdum luteoviridescente; aperturâ margine cinereo-nigrescente.*

Dimensions.—Var. α, 1·80 poll. longa; 1·28 ad 1·40 lata; 0·76 ad 0·80 convexa. Var. ε, long. 1·20 ad 1·40; lat. 0·96 ad 1·08; conv. 0·48 ad 0·52 poll.

Hab. ad Insulas Philippinas. Var. α and γ from Agoo, province of Pangasinan, island of Luçon: on stones in a rapid river. The var. β, δ, and ε, from Iba, province of Sambales, island of Luçon: on stones in a deep river.

The only difference I find between the varieties brought from the Philippine Islands and those from Guam (of which I have only been able to examine a single specimen) is, that the former are rather more solid and more convex. As to form and colour, they are too variable to dwell upon.

The operculum of this *Navicella* has particular characters, which it is important should be known, as confirming the specific value of this shell.

Operculum almost square, rather longer than broad, subconvex above, of a light bluish black mingled with flesh-colour, striated upon the surface and upon the anterior side, divided by a broad and shallow canal, ending in a deep and wide anterior notch, which is cut square at the base. The canal and notch are bounded on the right by a smooth, linear, flesh-coloured rib, which is a little prolonged and truncated at the end with a furrow throughout its length. The left side of its inferior surface is striated above, sinuous at the margin and finely denticulated at its base, which is of a rosy red.

2. Navicella variabilis. *N. testâ elliptică, striis vix sub lente cancellatâ, lineolis transversis undulatis obsoletisque sæpiùs confluentibus olivaceis et maculis lutescentibus nigrescente anticè obumbratis*

variegatâ; apice marginali eroso, retusissimo; labio albo, posticè aurantio, margine subrecto; aperturâ albido-cærulescente.

Long. 1·16 ad 1·28; lat. 0·80 ad 0·84; conv. 0·46 ad 0·54 poll.

Var. β. *T. ovatâ, posticè subtruncatâ, tenuiusculâ; apice ante marginem inserto, deroso.*

Long. 1·24 ad 1·28; lat. 1·10 ad 1·14; conv. 0·52 ad 0·56 poll.

Hab. Cagayan, province of Misamis, island of Mindanao: found on stones in a large river.

Although these two varieties appear to differ from each other in the position of the summit, I do not think they can be separated. Nevertheless the operculum varies perceptibly, and if their respective characters proved constant, which it would be necessary to verify by examining a certain number of specimens, then alone could one be distinguished from the other. The surface of this *Navicella* shows upon the anterior side longitudinal striæ, as deeply impressed as the transverse ones.

The operculum of the type is blackish throughout, except at the base, which is of an orange-red. The anterior side is notched. The dental apophysis is linear, smooth, a little raised, faintly striated both longitudinally and transversely. The external margin of this tooth projects but little, and its inferior part shows the commencement of a crest, but without teeth.

The operculum of the variety is of a rosy colour, with the inferior margin of an orange-red; the anterior side is more slightly notched in the middle, its dental apophysis projects rather more, and is linear, smooth, and divided by a longitudinal groove. The external margin of this tooth is narrow, without any trace of a denticulated crest at its base.

3. Navicella suborbicularis. Sowerby, Cat. Tank. App. p. 10. No. 1092; Récluz in Guérin, Rev. Cuv. 1841. p. 377. No. 10.

Var. β. Récluz, l. c.; Rumph. Mus. Amb. p. 40. f. 0. Optime.

Var. γ. Minori, tenuiori.

Hab. ad Insulas Philippinas. From the island of Camiguing: found on stones in mountain-streams. Var. β, from Cagayan, province of Misamis, island of Mindanao: on stones in a large river. Var. γ, from Banguey, province of North Ylocos, island of Luçon: found on stones in a small stream.

I see neither in the general form nor in the operculum of these varieties any character sufficient to distinguish them from the type: the colour alone is variable.

The operculum is of a pale flesh-colour, flattened with an arched notch at the anterior side. The apophysis projecting, smooth, a little more arcuated than that of the operculum of *Nav. Janelli*; its external margin is narrower, almost straight, finely crenulated in its lower half. The posterior border is very thin and of a dirty red.

4. Navicella Luzonica, Souleyet. *N. testâ ellipticâ, rufo-fuscâ seu olivaceâ unicolori seu nigro obsoletè reticulatâ aut punctatâ, lateribus compressiusculâ, dorso valdè convexâ, solidâ; apice ad marginem posteriorem incurvo, subintegro ac eroso; labio semi-*

lunari aurantio, anticè rectiusculo; aperturâ albido-cærulescente, margine posteriore laterali nigrescente.

Nav. Luzonica, Souleyet, Rev. Cuv. 1841. p. 375. No. 6. *Junior.*

Var. β. *T. olivaceo-fuscescente, maculis minimis lutescentibus vix nigrescente marginatis irroratâ.*

Var. γ. *T. rufo-fuscâ immaculatâ; apice deroso, convexo.*

Var. δ. *T. rufo-fuscâ, posticè tenuissime nigro et lutescenti longitudinaliter lineolatâ, maculisque minimis lutescentibus conicis nigro-marginatis, obsoletisque (sub lente) pictâ.*

Var. ε. *T. rufo-fuscâ, inter oculum et laminam maculis minimis subnigrescentibus adspersâ.*

Var. ζ. *T. minori, tenuiori, olivaceâ, posticè lineolatâ, suprà nigro tenuissime reticulatâ, anticè maculis squamiformibus pictâ, labio stramineo, nigrescente circumvallato.*

Long. 1·28 ad 1·60; lat. 0·84 ad 1·12; conv. 0·52 ad 0·76 poll.

Hab. From Dingle, province of Ylo Ylo, island of Panay: found in a placid river on stones. The var. γ and δ from Cagayan, province of Misamis, island of Mindanao: on stones in a large river. Var. ε, from the mountains of the island of Negros: found on the rocky bed of a small stream.

The individual which served as type to M. Souleyet was young, and had been brought home in spirits of wine, which hindered him from seeing the black lines which adorn the external surface of this *Navicella*. There is then no difference between his specimen and these of Mr. Cuming.

The operculum of this *Navicella* is rose-coloured, clouded with white and blue, but the rose-colour predominates. The notch of its anterior portion is somewhat rounded; its subarcuated apophysis bears a longitudinal groove more or less impressed; the external margin of this apophysis is tolerably large, and rather concave below the middle, at the usual origin of the crest, which is wanting in this species. The inferior or internal surface is of a pale flesh-colour, with a blackish tint on its left margin. The muscular impression is rose-colour, very shining, almost square, truncated anteriorly and upon the left side, somewhat rounded at its base, straight and oblique on the right side, with an acute angle at its base.

This operculum varies in form and colour; its notch in one individual had the form of a Λ, or profoundly acute; in others it was very open: some are altogether rose-coloured, others rosy on one side, yellow on the other, and blackish in the middle; others again almost entirely of a bluish tint, and mingled with these various colours.

The summit, sometimes almost entire or decorticated only, is at other times entirely eroded at its inferior surface; it is prolonged upon the posterior margin of the opening, though not beyond, and there it is worn away, as if it had been rubbed upon a grindstone.

5. Navicella Cumingiana. *N. testâ orbiculari seu ovatâ, convexâ, solidâ, vix striatâ luteo-fuscescente, lineis concentricis nigris undulatis arcuatisve interdum reticulatis cinctâ; apice marginali*

eroso, retuso; labio plano, albo, anticè in medio producto ; aperturâ albâ, cordiformi.

Var. β. *T. nigro-reticulatâ, lutescente maculatâ et subfasciatâ.*

Var. γ. *T. ovato-ellipticâ, dilutè olivaceâ, posticè lineolis nigris transversis, interdum majoribus et remotis notatâ.*

Hab. Var. *a* et *c* from a mountain-stream in the island of Camaguing. Var. β from Cagayan, island of Mindanao.

Long. 1·00 ad 1·20; lat. 0·84 ad 0·92; conv. 0·40 ad 0·56 poll.

The columella is 0·24 to 0·28 poll. in diameter.

Operculum irregularly oval, of an uniform white or rayed with rose-colour above, profoundly notched anteriorly; the notch rounded at its base. The apophysary rib is only apparent at the anterior summit of the operculum; it projects but little, and is nearly acute. Its external margin is oblong, very thin and very smooth; the left or opposite margin is striated, somewhat imbricated above, and crenulated throughout its extent. The inferior surface is of a pale uniform flesh-colour. The subrotund or oboval muscular impression is of a rose-red anteriorly, and of a dark red at the base. Upon the operculum of the var. γ the left margin is completely wanting, which gives an oblong and a subtriangular form to the muscular impression. These characters are only accidental.

I have dedicated this interesting species to Mr. Cuming, whose numerous discoveries in natural history have enriched science with a crowd of new facts, as a testimony of my esteem.

6. Navicella Clypeolum. *N. testâ ovato-oblongâ, anticè et posticè rotundatâ, tenuè et concentricè striatâ, lineolis nigro-violaceis seu purpurascentibus, interdum confluentibus et maculis albido-lutescentibus oblongis elongatisve nigro-marginatis sub-serialibus et passim radiis pallidis binis pictâ; apice brevi ad dextram vix obliquante, ante marginem posito; labio semilunari, convexiusculo, fuscescente; aperturâ patulâ.*

Var. β. *T. olivaceo-nigricante, maculis obsoletis; apice eroso; labio latiore, carneo, in medio subproducto, recto.*

Var. γ. *T. olivaceâ, lutescente maculatâ, in medio ventre obsoletè biradiatâ; apice purpurascente, labio fuscescente.*

Var. δ. *T. atratâ, immaculatâ; apice eroso; labio et margine aperturæ carneo-fuscescentibus.*

Var. ε. *T. nigrescente lineolatâ pallide virescente radiatâ et maculatâ, apice submarginali roseo, integerrimo.*

Var. ζ. *T. fuscescente maculis linearibus albidis nigro acutè marginatis obsoletis sparsis variegatâ; apice purpurascente; labio et margine aperturæ dilutè fuscis.*

Long. 0·80 ad 1·32; lat. 0·76 ad 0·92; conv. 0·24 ad 0·48 poll.

Hab. Var. β and γ from Cagayan. Var. α and ε from Banguey, province of North Ylocos, island of Luçon: found on stones in a mountain stream. Var. γ, island of Guimaras, on the rocky bed of a small stream. Var. δ, rocky bed of a stream in the mountains of the isle of Negros. The type itself is found at Pasuguing, province of North Ylocos, island of Luçon.

Operculum almost square, thin, of a rose-colour, cut squarely an-

teriorly, with a projecting, obtuse, linear tooth, which is divided by a slightly impressed longitudinal groove; the right margin very narrow, very thin, and without crest.

It is possible that this species may prove only a stronger, more robust state of the *Nav. tessellata*; nevertheless it differs in its general form, and its operculum also shows some differential characters.

7. Navicella tessellata, Lamarck.

Var. *α. T. lateribus angustatâ, subrectis; sub epidermide lutescente lineolis violaceis seu purpureis creberrimis, et maculis conicis concentricè seriatis pictâ; vertice recto, luteo; labio triangulari, anticè subarcuato, lateribus prolongato.*

Var. *β. T. ut in var. α, sed posticè subemarginatâ; griseo-fuscâ, maculis minoribus luteo-fuscescentibus conicis crebrè pictâ; apice dilutè purpurascente, recto; labio subtriangulari, angusto, roseo, anticè arcuato.*

Var. *γ.*? *T. oblongo-ellipticâ, anticè et posticè rotundatâ, crassiore sive oblongo-acutâ, lateribus angustatâ, nigerrimâ, apice eroso; labio semilunari, interdum triangulari, latiore, subrecto, lateribus non prolongatis.*

An *Nav. Clypeolum*, var.? credo, sed difficile est probandi sine operculo.

Long. 0·80 ad 0·92; lat. 0·76 ad 0·92; conv. 0·24 ad 0·48 poll.

Hab. Var. *α*, Cagayan: found in a large river on stones. Var. *β*, from Baccara, province of North Ylocos, island of Luçon: found on stones in a placid river. Var. *γ*.?, from Abulug, province of Cagayan, island of Luçon: found on stones in a large river.

Operculum square, a little elongated, narrow, and cut almost square anteriorly, with a slight notch towards the apophysis, which is slightly curved inwards (instead of being straight or turned backwards, as in that of *Nav. clypeolum*). The inclined angle of the middle of the left side is deeper, and in this species shows a depression or broad canal, in form of a Λ, the whole length of the apophysis; this canal is limited to the left by two slightly raised ribs.

These characters of the operculum, if they be constant, should suffice to avoid all confusion of this species and the one which precedes.

8. Navicella lineata, Lamarck.

Var. *α. T. oblongâ, posticè acutâ, luteo-aureâ, supernè lineis spadiceis radiantibus ex lineolis transversis obumbratis, anticè et lateraliter maculis oblongo-conicis subserialibus pictâ; apice lateraliter compresso, suprà fornicato, roseo-purpurascente recto, marginali; labio angusto-triangulari, medio concavo-emarginato, lateribus anticè prolongatis.*

Var. *β. T. ellipticâ, posticè angustatâ, lutea medio dorsi lineis nigris angustis et latiusculis, et lineolis obliquis creberrimis radiis latioribus lateraliter efformantibus interdum confluentibus pictâ, labio triangulari anticè arcuato.*

Var. *γ. T. oblongâ, posticè angustâ, subacutâ, luteâ radiis angustis nigris medio dorsi notatâ, anticè et lateraliter crebrè nigrescente*

lineolatâ, et maculis linearibus luteis subseriatis pictâ; apice subviolascente; labio triangulari, anticè arcuatim excavato.

Var. δ. *T. elongatâ, lateribus compressâ, dorso convexo-fornicatâ, anticè subacuto, interdum truncato; luteo-fuscescente, maculis oblongis anticè nigris acutis lateraliter lineolis tenuissimis obsoletisque obumbratis pictâ; apice interdum nigrescente, labio triangulari, luteo-fuscescente.*

Var. ε. *T. oblongo-ellipticâ, lateribus compressâ, lineolis pallide fuscis aut purpurascentibus, et maculis oblongo-conicis luteis pictâ; radiis binis, pallide luteis in medio dorsi notatâ; labio triangulari, anticè arcuato.*

Var. α: long. 0·88 ad 1·08; lat. 0·44 ad 0·56; conv. 0·24 ad 0·48 poll. Var. β and γ: long. 0·96 ad 1·04; lat. 0·60 ad 0·64; conv. 0·32 ad 0·36. Var. δ: long. 0·52 ad 0·64; lat. 0·32; conv. 0·28 ad 0·32.

Hab. Var. α, from Banguey, province of North Ylocos: on stones in a mountain-stream. Var. β, from Cagayan: on stones in a large river. Var. δ, from Baccara: on stones in a rapid river. Var. ε.?, cum præcedenti.

All these varieties are very remarkable, and, with the exception of var. ε, whose operculum I have not seen, all certainly belong to the same species. The operculum of *Nav. lineata* is oblong, very thin, pale yellow, a little inclined to pale green, rounded behind, notched before, notch in an oblique line at the base. The left side of this operculum is slightly arcuated in the centre; the right side almost rectilinear and limited by an apophysary tooth, very narrow and a little prolonged anteriorly. Muscular impression triangular, elongated, inclined obliquely to the left.

9. Navicella Entrecastauxi, Récluz. Rev. Cuvier. p. 380, No. 14.

Var. β. *T. obovatâ, nigro-purpurascente, concentricè et crebrè lineolatâ, maculis luteis conicis aut subquadratis pictâ; apice purpurascente marginali, non exserto; aperturâ albido-cærulescente.*

Long. 0·80 ad 0·90; lat. 0·56 ad 0·60; conv. 0·20 ad 0·28 poll.

Hab. ad insulas Philippinas.

Operculum almost square, of the form and sculpture of that of *Nav. tessellata*, offering however some characters which the state of that which was submitted to me does not allow me to judge of with certainty. Its colour is of a rosy white, and yellow in the centre. It is possible that the *N. Entrecastauxi* may prove only an oboval variety, with a marginal summit of *N. tessellata*. When I shall have seen a greater number of specimens with their opercula I may be enabled to pronounce with more certainty.

It results from this examination of the *Navicellæ* collected by Mr. Cuming, together with those I have had an opportunity of studying up to the present time—1st, that the number of known species of this genus amounts at present to eighteen; 2ndly, that the Asiatic Islands is that part of the world which contains the greater number of species; and 3rdly, that Polynesia is afterwards the most rich locality in species of this genus.